REMARKS/ARGUMENTS

Reconsideration is respectfully requested of the Official Action of December 24, 2009, relating to the above-identified application.

The claims in the case are 1 to 6, 9, 12 to 17, 19, 20, and 23 to 28. Claims 14 to 17, 19, 20, 23 and 24 stand withdrawn from further consideration as being directed to a non-elected invention. Rejoinder of all method claims is requested.

Applicants wish to emphasize that the present invention relates to an exhaust treatment device which is formed of a substrate and a 1-catalyst layer deposited on the substrate wherein the catalyst layer itself comprises a first catalytic metal, preferably palladium, and as the second catalytic metal, preferably rhodium. The catalyst layer is present as a combined loading on a support forming a mixed layer of the first and second catalyst metal. It is the nature of applicant's mixed layer that forms the focal point of the present invention.

Applicant's single, mixed 1-layer catalyst design, results in the advantage of a more simple catalyst design compared to the 2-layer catalyst.

Unlike conventional 2-layer catalyst designs, the catalyst of the invention is a single mixed layer catalyst capable of preventing Pd-Rh interaction; i.e., preventing alloy formation. As such, the 1-layer catalyst is capable of maintaining its palladium function and its rhodium function; see [0033].

Applicant's single catalyst layer can be deposited from a slurry containing the combined loading of first and second catalytic metals onto the substrate so that the palladium and rhodium,

and any other catalyst metals are combined as a mixed layer of Pd/Rh on the substrate; see [0037] and [0074]. The mixed layer is formed from the slurry comprising the palladium salt, rhodium salt, a support (e.g. aluminum oxide) and oxygen storage component.

In this mixed layer, the first and second catalytic metals and any other catalytic metals are combined with no effort being made to chemically fix or otherwise separate the precious metals; see [0040]. The advantages of the single mixed layer are described also in para. [0074]. A more uniform catalyst layer is achieved in this way.

These features of the present invention establish the critical distinction with respect to the prior art of record for reasons to be explained in more detail hereinbelow.

The rejection of Claims 1 to 6, 8, 9, 27 and 28 under 35 U.S.C. § 103(a) as unpatentable in view of the U.S. patent of *Sung*, U.S. 5,981,423 taken with the *Fujitani* patent, U.S. 4,239,656 is traversed and reconsideration is respectfully requested.

The Office Action of December 24, 2009 describes the *Sung* patent as showing an exhaust treatment device containing a substrate and a one-layer catalyst deposited on the substrate where the first catalytic metal such as palladium (Pd) and the second catalytic metal such as rhodium (Rh) form "a mixed layer" and wherein greater than or equal to about 70% of the first and second catalyst metals are non-alloyed under alloying conditions. To support the allegation that *Sung* also shows "a mixed layer" of the first and second metals, the Office Action says the: "... by indicating that the layers are not 100% separated, the layers are considered to be mixed...". [page 3, lines 2-3]. *Sung* however says nothing about the layers "are not 100%

separated". No citation has been given to support the allegation that *Sung* would inherently show a mixed layer. A rejection cannot be based on what a reference does not disclose.

Sung describes his catalyst in col. 6, lines 41, *et seq.*, as comprising a first support with the first precious (catalytically active) metal and a second support with a second precious (catalytically active) metal.

The first and second supports of *Sung* can be chemically the same or different and can be a material such as aluminum oxide (alumina); see col. 7, lines 38-41. What is critical for *Sung* is that the particle size of his first and second supports is different. Hence, in that way the supports of *Sung* are physically different although they may chemically be indistinguishable. Nothing is said by *Sung* that his catalysts are present in a mixed layer.

The Official Action expresses as the reason in support of the rejection that *Sung* would inherently have a mixed layer. The inherent teaching of a prior art reference is a question of fact and can arise in both the context of anticipation and obviousness. *In re Napier,* 55 F.3d 610, 613, 34 USPQ2d 1782, (Fed. Cir. 1995). It is also well established that an allegation that a certain result or characteristic may occur or be present in the prior art is not a sufficient basis to establish the inherency of that particular result or characteristic. See, *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955 (Fed. Cir. 1993) which reversed a rejection because inherency was based on what would result due to optimization of conditions and not what was necessarily always present in the prior art. See also, *In re Oelrich*, 666 F.2d 578, 212 USPQ 323 (CCPA 1981). To establish inherency, the extrinsic evidence must make clear that the missing

descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. See, *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999).

In relying upon the theory of inherency, the burden is upon the PTO to provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. See, *Ex Parte Levy*, 17 USPQ2d 1461 (BPAI 1990).

It is clear from the cases quoted above that the courts have emphasized that in order to sustain a rejection based on inherency, the burden is upon the PTO to establish that the claimed result would necessarily result from the operation of the patented invention.

Applicants submit that the Office Action does not present sufficient evidence to establish that *Sung* necessarily has a mixed layer of catalyst metals.

Sung describes his catalyst in col. 8, beginning at line 25 and says that his layer is supported on a substrate. The layer has an upper half and a bottom half. Greater than 50 wt% of the first support and first precious metal is located in the bottom half of the layer. And greater than 50 wt% of the second support and second precious metal is located in the upper half of the layer. Thus *Sung* teaches that his layer of catalyst has greater than 50wt% of the first precious metal in the bottom half and greater than 50wt% of the second metal in the upper half.

Therefore, according to *Sung* 100% of the first catalyst can be on the "bottom layer" and 100% of the second catalyst can be in the "top layer". *Sung* specifically points out that segregation of the components with the upper and lower half of the layer is achieved in this way; see col. 8, lines 65-67. It is therefore clear that *Sung* intends to have a segregated layer instead of a uniform layer. Applicants claim that their 1-layer is with no separation of precious metals. See [0074]. Nothing in *Sung* establishes that *Sung* necessarily has a mixed layer.

Sung emphasizes that his support for the first precious metal and the support for the second precious metal have different particle sizes thereby enabling the gradient of precious metals in the catalyst layer. See col. 6, beginning at line 41 where *Sung* shows that the average particle size of the second support is greater than the average particle size of the first support. The result of this difference in particle size of the support is described in col.7 beginning at line 1. Thus a concentration gradient across the thickness of the layer is obtained to achieve the segregation that *Sung* desires. See, col.7 lines 9-12. It is therefore apparent that the use of first and second supports of different particle sizes is critical for *Sung's* invention in order to segregate the precious metals.

In contrast, Applicant's claims distinguish from *Sung* by defining applicant's catalyst layer as comprising the first catalyst metal and the second catalyst metal as a combined loading on a support to form a mixed layer of the first and second catalyst on the substrate. The result is that in applicant's invention the first and second catalyst metals are mixed together, not segregated, to create a mixed layer. *Sung* does not have his two metals as a combined loading on

the identical support to form a mixed layer of Pd/Rh. *Sung* has two distinct supports because of the difference in particle sizes and hence his loading is not of a combination of the metals on the support, but rather separate loadings on physically different supports to form a segregated layer instead of a uniform layer such as applicant's layer.

While *Sung* takes special measures to segregate his first and second catalytic metals by controlling particle size, applicant has, to the contrary, made no effort to separate the precious metals [0040]. The result is that applicant uses a combined loading of the precious metals to form a mixed layer instead of a layer having a gradient layer as described by *Sung* in col. 8, lines 25-42.

A careful review of the *Sung* patent shows that it discloses a single layer which contains Pd on separate first support and Rh on a separate second support, wherein the two supports differ in particle size. *Sung* notes that the palladium and rhodium alloy formation will occur with detrimental effects; see col. 9, lines 50 to 55 and col. 13, lines 6 to 12.

The improvement alleged by *Sung* relating to overcoming this problem is explained by *Sung* in col. 7, lines 1 to 38 and col. 8, lines 25 to 67. This is said to be accomplished by generating a clear bi-modal distribution of support particle sizes for separating the palladium and rhodium metals.

Sung teaches in col. 8, lines 43, *et seq.*, that a separate slurry is prepared for the first precious metal and its own support and a separate slurry is prepared for the second precious metal on its own support. The two slurries are then combined and deposited on the substrate. In

contrast, the support used by applicant does not have a bi-modal distribution; i.e. applicant's support does not have the particle differences required by *Sung*.

According to *Sung*, palladium is selectively put on the smaller particle sized support and, thus, will segregate to the bottom of the layer during coating and the rhodium is on the larger particle sized support and will segregate to the top of the layer. Thus, following the teachings of *Sung*, there is obtained a type of separation as in a 2-layer catalyst wherein palladium is in the first or bottom layer and rhodium is in the top or second layer. See, for example, col. 7, lines 1 to 18.

This type of product requires separate milling of the palladium and the rhodium slurries. In one case, the palladium is prepared and fixed to one slurry, milled to a smaller particle size of 90% being less than 10 microns (see example 1, column 20, lines 34 to 40) and then adding the rhodium slurry and milling further to reduce the rhodium support to 90% being less than 25 microns. Alternatively, one can mill each slurry separately and finally combine them as the final coating slurry. Examples 3 and 4 of the *Sung* patent show that slurries are milled separately and finally combined to give a single coating slurry.

Sung admits that separation of the Pd and Rh using different supports and particle sizes is critical. In the present application no effort is made to separate the PGM by particle size differences and, in fact, applicant specifically avoids having different particle sizes for the Pd and Rh supports.

The *Sung* patent fails to show performance from a true reference catalyst where the particle sizes are the same for the supports used for Pd and Rh so alloy formation could occur as *Sung* said it would. *Sung* did not measure by XRD if alloy formation occurred. *Sung* also did not do full separation of the Pd and Rh supports in a two layer design with the same total wash coat load as applicant did in Figures 2 - 4 so as to prove that the performance is the same for the single layer design of his invention. Thus, there is no data in the *Sung* patent whatsoever to show that *Sung* got reference performance values for a Pd/Rh segregated design or for a design where Pd and Rh interact and form alloys. Applicant has shown that applicant gets performance identical for a 2-layer design (Figures 2 – 4) with the same wash coat loading and overall wash coat composition. *Sung* also did not show SEM or other data indicating separation of the Pd and Rh wash coat components by their preparation method.

The Official Action alleges that it would have been obvious to a person having ordinary skill in the art at the time of the invention to replace the supports of *Sung* with the supports found in the *Fujitani* patent. However, it should be noted that *Sung* requires that each of the precious metal components have its own support and that each support has a different particle size. Consequently, a person skilled in the art would not necessarily conclude that both precious metals of *Sung* should be placed on the single support of *Fujitani*. That would be against the teachings of *Sung*. Two different supports for the two different precious metal components shown in the *Sung* patent are described, beginning in col. 6, at line 40. *Sung* specifically teaches that the particle size must be different for the two precious metals and, therefore, a person skilled

in the art would not be lead to replace the two different supports of *Sung* with the particular support of *Fujitani*, which is a single support. The *Fujitani* support does not have two different particle sizes. Therefore, a person skilled in the art with the knowledge of these two references would not be lead to the conclusion that the two different supports of *Sung* should be replaced with the single support of *Fujitani*. Thus, the two references are not compatible and have divergent teachings which would not lead a person skilled in the art to follow the proposal set forth in the Official Action. Consequently, applicant respectfully submits that the combination of references does not create *prima facie* obviousness of the claimed invention.

With respect to Claims 3-6 and 9, the comments made apply here as well. The references fail to create *prima facie* obviousness of the claimed invention.

As further evidence of the differences between the present invention and the prior art, reference is made to the Declaration of John Nunan of record.

The Figures 1 to 3 show the improvement in conversion obtained when using a washcoated with a pore size in the range of 150Å to 1000 Å.

Figures 4, 5 and 6 demonstrate that applicant obtains a mixed layer of the catalytic metal throughout the washcoat.

Figures 7 and 8 are further evidence of the mixed layer of catalytic metal in applicant's washcoat.

The evidence clearly shows that, unlike the segregated coatings of the prior art, applicant obtains a mixed layer of catalytic metal in his washcoat contrary to the expectations of the prior art teachings.

Applicant's invention featuring the non-segregated washcoat is therefore contrary to the teachings of the prior art and hence is a patentable invention.

The rejection of Claims 12 and 26 under 35 U.S.C. § 103(a) as unpatentable over *Sung, et al.*, taken with *Fujitani* and further in view of *Anatoly, et al.*, US 6,387,338 (of record), is traversed and reconsideration is respectfully requested.

Claim 12 is dependent on Claim 1 and differs therefrom by specifying the chemical composition of the oxygen storage components. Claim 26 is dependent on Claim 1 and specifies more particular values of the subscripts for the oxygen storage material of formula 1. It has already been explained that the combination of *Sung* and *Fujitani* does not create *prima facie* obviousness for the claimed subject matter of Claim 1 and, therefore, the same arguments apply with respect to Claims 12 and 26.

The addition of *Anatoly* does not fulfill the shortcomings of the combination of references and, consequently, applicant respectfully submits that a person skilled in the art would not be lead to the claimed invention from a thoughtful consideration of the teachings of the references.

The rejection of Claim 13 under 35 U.S.C. § 103(a) in view of *Sung* taken with *Fujitani* and further in view of *Suzuki*, US 6,335,305 is traversed and reconsideration is respectfully

requested. Claim 13 depends on Claim 1 and differs therefrom by specifying that the oxygen storage component has a stable cubic structure.

The shortcomings of the *Sung* and *Fugitani* references have already been discussed above and those comments apply here as well.

Applicant respectfully submits that even if the teachings of *Suzuki* were combined with those of the principal references, the resulting combination of teachings would not lead to the present invention. Consequently, it is respectfully submitted that the rejection of Claim 13 is not well-founded and should be withdrawn.

The rejection of Claim 25 under 35 U.S.C. § 103(a) in view of *Sung* and *Foster* U.S. 5,857,140 is traversed and reconsideration is respectfully requested.

Claim 25 is directed to an exhaust treatment device comprising a substrate and a catalytic layer and differs from Claim 1 by specifying that it also includes a retention material disposed around the substrate to form a subassembly and a housing disposed around a subassembly.

The *Foster* patent is relied on to show a retention material and a housing. However, the combination of references does not establish *prima facie* obviousness of the claimed invention because the principal references of *Sung* fails to show the mixed layer for the reasons explained above. The rejection of Claim 25 should therefore be withdrawn.

Consequently, a person skilled in the art would not be lead to the present invention by a consideration of the references relied on in the Official Action.

The rejection is deemed to be improper and therefore, withdrawal thereof is respectfully requested.

Favorable action at the Examiner's earliest convenience is respectfully requested.

Respectfully submitted,

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